



SEQUENCE LISTING

<110> Millennium Pharmaceuticals, Inc.
Curtis, Rory A.J.

<120> NOVEL MEMBERS OF THE CAPSAICIN/VANILLOID
RECEPTOR FAMILY OF PROTEINS AND USES THEREOF

<130> MPI98-093P2RCP3DV1AM

<140> US 09/587,111

<141> 2000-06-02

<150> US 09/439,165

<151> 1999-11-12

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<151> 1999-02-26

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 Phe Arg Ser Gly Lys Leu Leu Gln Val Gly Tyr Thr Pro Asp Gly Lys
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 His Glu Glu Gly Glu Leu Asp Ser Cys Pro Thr Ile Thr Val Ser Pro
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 Val Ile Thr Ile Gln Arg Pro Gly Asp Gly Pro Thr Gly Ala Arg Leu
 85 90 95
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Ala	Ser	Tyr	Thr	Asp	Ser	Tyr	Tyr	Lys	Gly	Gln	Thr	Ala	Leu	His	Ile	
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Phe	Val	Thr	Ser	Met	Tyr	Asn	Glu	Ile	Leu	Met	Leu	Gly	Ala	Lys	Leu	
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His	Pro	Thr	Leu	Lys	Leu	Glu	Glu	Leu	Thr	Asn	Lys	Lys	Gly	Met	Thr	
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Pro	Leu	Ala	Leu	Ala	Ala	Gly	Thr	Gly	Lys	Ile	Gly	Val	Leu	Ala	Tyr	
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Ala Tyr Ser Ser Ser Glu Thr Pro Asn Arg His Asp Met Leu Leu Val	
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Glu Pro Leu Asn Arg Leu Leu Gln Asp Lys Trp Asp Arg Phe Val Lys	
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Gly Ser Thr Gly Lys Thr Cys Leu Met Lys Ala Val Leu Asn Leu Lys
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Tyr	Met	Phe	Ile	Phe	Thr	Ala	Val	Ala	Tyr	His	Gln	Pro	Thr	Leu	Lys		
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Lys	Gln	Ala	Ala	Pro	His	Leu	Lys	Ala	Glu	Val	Gly	Asn	Ser	Met	Leu		
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Lys Phe Ala Pro Gln Ile Arg Val Asn Leu Asn Tyr Arg Lys Gly Thr
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Tyr Arg Gly His Ser Ala Leu His Ile Ala Ile Glu Lys Arg Ser Leu
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 Tyr Leu Ser Lys Thr Ser Lys Tyr Leu Thr Asp Ser Glu Tyr Thr Glu
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 Asp Gly Val Asn Ala Cys Ile Leu Pro Leu Leu Gln Ile Asp Arg Asp
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 Ser Gly Asn Pro Gln Pro Leu Val Asn Ala Gln Cys Thr Asp Asp Tyr
 145 150 155 160

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 Tyr Arg Gly His Ser Ala Leu His Ile Ala Ile Glu Lys Arg Ser Leu
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cag tgt gtg aag ctc ctg gtg gag aat ggg gcc aat gtg cat gcc cgg 576
 Gln Cys Val Lys Leu Leu Val Glu Asn Gly Ala Asn Val His Ala Arg
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gcc tgc ggc cgc ttc ttc cag aag ggc caa ggg act tgc ttt tat ttc 624

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Gly	Glu	Leu	Pro	Leu	Ser	Leu	Ala	Ala	Cys	Thr	Lys	Gln	Trp	Asp	Val		
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Val	Ser	Tyr	Leu	Leu	Glu	Asn	Pro	His	Gln	Pro	Ala	Ser	Leu	Gln	Ala		
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act	gac	tcc	cag	ggc	aac	aca	gtc	ctg	cat	gcc	cta	gtg	atg	atc	tcg	768	
Thr	Asp	Ser	Gln	Gly	Asn	Thr	Val	Leu	His	Ala	Leu	Val	Met	Ile	Ser		
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Asp	Asn	Ser	Ala	Glu	Asn	Ile	Ala	Leu	Val	Thr	Ser	Met	Tyr	Asp	Gly		
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Leu	Leu	Gln	Ala	Gly	Ala	Arg	Leu	Cys	Pro	Thr	Val	Gln	Leu	Glu	Asp		
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Ile	Arg	Asn	Leu	Gln	Asp	Leu	Thr	Pro	Leu	Lys	Leu	Ala	Ala	Lys	Glu		
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Gly	Lys	Ile	Glu	Ile	Phe	Arg	His	Ile	Leu	Gln	Arg	Glu	Phe	Ser	Gly		
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Arg	Val	Ser	Leu	Tyr	Asp	Leu	Ala	Ser	Val	Asp	Ser	Cys	Glu	Glu	Asn		
			340				345						350				
tca	gtg	ctg	gag	atc	att	gcc	ttt	cat	tgc	aag	agc	ccg	cac	cga	cac	1104	
Ser	Val	Leu	Glu	Ile	Ile	Ala	Phe	His	Cys	Lys	Ser	Pro	His	Arg	His		
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cga	atg	gtc	gtt	ttg	gag	ccc	ctg	aac	aaa	ctg	ctg	cag	gcg	aaa	tgg	1152	
Arg	Met	Val	Val	Leu	Glu	Pro	Leu	Asn	Lys	Leu	Gln	Ala	Lys	Trp			
		370				375					380						
gat	ctg	ctc	atc	ccc	aag	ttc	ttc	tta	aac	ttc	ctg	tgt	aat	ctg	atc	1200	
Asp	Leu	Leu	Ile	Pro	Lys	Phe	Phe	Leu	Asn	Phe	Leu	Cys	Asn	Leu	Ile		
					390					395				400			
tac	atg	ttc	atc	ttc	acc	gct	gtt	gcc	tac	cat	cag	cct	acc	ctg	aag	1248	
Tyr	Met	Phe	Ile	Phe	Thr	Ala	Val	Ala	Tyr	His	Gln	Pro	Thr	Leu	Lys		
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aag	cag	gcc	gcc	cct	cac	ctg	aaa	gcg	gag	gtt	gga	aac	tcc	atg	ctg	1296	
Lys	Gln	Ala	Ala	Pro	His	Leu	Lys	Ala	Glu	Val	Gly	Asn	Ser	Met	Leu		
			420					425					430				
ctg	acg	ggc	cac	atc	ctt	atc	ctg	cta	ggg	ggg	atc	tac	ctc	ctc	gtg	1344	
Leu	Thr	Gly	His	Ile	Leu	Ile	Leu	Leu	Gly	Gly	Ile	Tyr	Leu	Leu	Val		
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ccc ctg ctt gtg tct gcg ctg gtg ctg ggc tgg ctg aac ctg ctt tac Pro Leu Leu Val Ser Ala Leu Val Leu Gly Trp Leu Asn Leu Tyr 500 505 510	1536
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aag gtc atc ctg cgg gac ctg ctg cgc ttc ctt ctg atc tac tta gtc Lys Val Ile Leu Arg Asp Leu Leu Arg Phe Leu Leu Ile Tyr Leu Val 530 535 540	1632
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ctc atc gcc ctc atg agc gag acc gtc aac agt gtc gcc act gac agc Leu Ile Ala Leu Met Ser Glu Thr Val Asn Ser Val Ala Thr Asp Ser 645 650 655	1968
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aat ggc tat tgg tgg tgc agg aag aag cag cgg gca ggt gtg atg ctg Asn Gly Tyr Trp Trp Cys Arg Lys Lys Gln Arg Ala Gly Val Met Leu 675 680 685	2064
acc gtt ggc act aag cca gat ggc agc ccg gat gag cgc tgg tgc ttc	2112

Thr Val Gly Thr Lys Pro Asp Gly Ser Pro Asp Glu Arg Trp Cys Phe	
690 695 700	
agg gtg gag gag gtg aac tgg gct tca tgg gag cag acg ctg cct acg	2160
Arg Val Glu Glu Val Asn Trp Ala Ser Trp Glu Gln Thr Leu Pro Thr	
705 710 715 720	
ctg tgt gag gac ccg tca ggg gca ggt gtc cct cga act ctc gag aac	2208
Leu Cys Glu Asp Pro Ser Gly Ala Gly Val Pro Arg Thr Leu Glu Asn	
725 730 735	
cct gtc ctg gct tcc cct ccc aag gag gat gag gat ggt gcc tct gag	2256
Pro Val Leu Ala Ser Pro Pro Lys Glu Asp Glu Asp Gly Ala Ser Glu	
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gag cta ccc ctc tct ttg gcc gct tgc acc aag cag tgg gat gtg gta	95
Glu Leu Pro Leu Ser Leu Ala Ala Cys Thr Lys Gln Trp Asp Val Val	
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agc tac ctc ctg gag aac cca cac cag ccc gcc agc ctg cag gcc act	143
Ser Tyr Leu Leu Glu Asn Pro His Gln Pro Ala Ser Leu Gln Ala Thr	
35 40 45	
gac tcc cag ggc aac aca gtc ctg cat gcc cta gtg atg atc tcg gac	191
Asp Ser Gln Gly Asn Thr Val Leu His Ala Leu Val Met Ile Ser Asp	
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aac tca gct gag aac att gca ctg gtg acc agc atg tat gat ggg ctc	239
Asn Ser Ala Glu Asn Ile Ala Leu Val Thr Ser Met Tyr Asp Gly Leu	
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ctc caa gct ggg gcc cgc ctc tgc cct acc gtg cag ctt gag gac atc	287
Leu Gln Ala Gly Ala Arg Leu Cys Pro Thr Val Gln Leu Glu Asp Ile	
80 85 90 95	
cgc aac ctg cag gat ctc acg cct ctg aag ctg gcc gcc aag gag ggc	335
Arg Asn Leu Gln Asp Leu Thr Pro Leu Lys Leu Ala Ala Lys Glu Gly	
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aag atc gag att ttc agg cac atc ctg cag cgg gag ttt tca gga ctg	383
Lys Ile Glu Ile Phe Arg His Ile Leu Gln Arg Glu Phe Ser Gly Leu	
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Ser His Leu Ser Arg Lys Phe Thr Glu Trp Cys Tyr Gly Pro Val Arg	
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Val Ser Leu Tyr Asp Leu Ala Ser Val Asp Ser Cys Glu Glu Asn Ser	
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Val Leu Glu Ile Ile Ala Phe His Cys Lys Ser Pro His Arg His Arg	
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Met Val Val Leu Glu Pro Leu Asn Lys Leu Leu Gln Ala Lys Trp Asp	
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ctg ctc atc ccc aag ttc ttc tta aac ttc ctg tgt aat ctg atc tac	623
Leu Leu Ile Pro Lys Phe Phe Leu Asn Phe Leu Cys Asn Leu Ile Tyr	
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atg ttc atc ttc acc gct gtt gcc tac cat cag cct acc ctg aag aag	671
Met Phe Ile Phe Thr Ala Val Ala Tyr His Gln Pro Thr Leu Lys Lys	
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Gln Ala Ala Pro His Leu Lys Ala Glu Val Gly Asn Ser Met Leu Leu	
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Thr Gly His Ile Leu Ile Leu Leu Gly Gly Ile Tyr Leu Leu Val Gly	
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Gln Leu Trp Tyr Phe Trp Arg Arg His Val Phe Ile Trp Ile Ser Phe	
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Ile Asp Ser Tyr Phe Glu Ile Leu Phe Leu Phe Gln Ala Leu Leu Thr	
275 280 285	
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Val Val Ser Gln Val Leu Cys Phe Leu Ala Ile Glu Trp Tyr Leu Pro	
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Leu Leu Val Ser Ala Leu Val Leu Gly Trp Leu Asn Leu Leu Tyr Tyr	
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Thr Arg Gly Phe Gln His Thr Gly Ile Tyr Ser Val Met Ile Gln Lys	
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Lys Ala Ile Ser Val Leu Glu Met Glu Asn Gly Tyr Trp Trp Cys Arg	
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Lys Lys Gln Arg Ala Gly Val Met Leu Thr Val Gly Thr Lys Pro Asp	
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Gly Ser Pro Asp Glu Arg Trp Cys Phe Arg Val Glu Glu Val Asn Trp	

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Ala Ser Trp Glu Gln Thr Leu Pro Thr Leu Cys Glu Asp Pro Ser Gly			
385	390	395	
gca ggt gtc cct cga act ctc gag aac cct gtc ctg gct tcc cct ccc			1247
Ala Gly Val Pro Arg Thr Leu Glu Asn Pro Val Leu Ala Ser Pro Pro			
400	405	410	415
aag gag gat gag gat ggt gcc tct gag gaa aac tat gtg ccc gtc cag			1295
Lys Glu Asp Glu Asp Gly Ala Ser Glu Glu Asn Tyr Val Pro Val Gln			
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Leu Leu Gln Ser Asn			
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Ser Ala Glu Asn Ile Ala Leu Val Thr Ser Met Tyr Asp Gly Leu Leu			
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Gln Ala Gly Ala Arg Leu Cys Pro Thr Val Gln Leu Glu Asp Ile Arg			
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115 120 125			
His Leu Ser Arg Lys Phe Thr Glu Trp Cys Tyr Gly Pro Val Arg Val			
130 135 140			
Ser Leu Tyr Asp Leu Ala Ser Val Asp Ser Cys Glu Glu Asn Ser Val			
145 150 155 160			
Leu Glu Ile Ile Ala Phe His Cys Lys Ser Pro His Arg His Arg Met			
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Val Val Leu Glu Pro Leu Asn Lys Leu Leu Gln Ala Lys Trp Asp Leu			
180 185 190			
Leu Ile Pro Lys Phe Phe Leu Asn Phe Leu Cys Asn Leu Ile Tyr Met			
195 200 205			
Phe Ile Phe Thr Ala Val Ala Tyr His Gln Pro Thr Leu Lys Lys Gln			
210 215 220			
Ala Ala Pro His Leu Lys Ala Glu Val Gly Asn Ser Met Leu Leu Thr			
225 230 235 240			
Gly His Ile Leu Ile Leu Leu Gly Gly Ile Tyr Leu Leu Val Gly Gln			
245 250 255			
Leu Trp Tyr Phe Trp Arg Arg His Val Phe Ile Trp Ile Ser Phe Ile			
260 265 270			

Asp	Ser	Tyr	Phe	Glu	Ile	Leu	Phe	Leu	Phe	Gln	Ala	Leu	Leu	Thr	Val
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Val	Ser	Gln	Val	Leu	Cys	Phe	Leu	Ala	Ile	Glu	Trp	Tyr	Leu	Pro	Leu
	290					295				300					
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305				310						315					320
Arg	Gly	Phe	Gln	His	Thr	Gly	Ile	Tyr	Ser	Val	Met	Ile	Gln	Lys	Lys
			325						330					335	
Ala	Ile	Ser	Val	Leu	Glu	Met	Glu	Asn	Gly	Tyr	Trp	Trp	Cys	Arg	Lys
		340					345						350		
Lys	Gln	Arg	Ala	Gly	Val	Met	Leu	Thr	Val	Gly	Thr	Lys	Pro	Asp	Gly
	355						360					365			
Ser	Pro	Asp	Glu	Arg	Trp	Cys	Phe	Arg	Val	Glu	Glu	Val	Asn	Trp	Ala
370						375				380					
Ser	Trp	Glu	Gln	Thr	Leu	Pro	Thr	Leu	Cys	Glu	Asp	Pro	Ser	Gly	Ala
385				390						395					400
Gly	Val	Pro	Arg	Thr	Leu	Glu	Asn	Pro	Val	Leu	Ala	Ser	Pro	Pro	Lys
			405					410						415	
Glu	Asp	Glu	Asp	Gly	Ala	Ser	Glu	Glu	Asn	Tyr	Val	Pro	Val	Gln	Leu
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cta ccc ctc tct ttg gcc gct tgc acc aag cag tgg gat gtg gta agc																96
Leu	Pro	Leu	Ser	Leu	Ala	Ala	Cys	Thr	Lys	Gln	Trp	Asp	Val	Val	Ser	
			20					25					30			
tac ctc ctg gag aac cca cac cag ccc gcc agc ctg cag gcc act gac																144
Tyr	Leu	Leu	Glu	Asn	Pro	His	Gln	Pro	Ala	Ser	Leu	Gln	Ala	Thr	Asp	
		35					40					45				
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Ser	Gln	Gly	Asn	Thr	Val	Leu	His	Ala	Leu	Val	Met	Ile	Ser	Asp	Asn	
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tca gct gag aac att gca ctg gtg acc agc atg tat gat ggg ctc ctc																240
Ser	Ala	Glu	Asn	Ile	Ala	Leu	Val	Thr	Ser	Met	Tyr	Asp	Gly	Leu	Leu	
65					70				75					80		
caa gct ggg gcc cgc ctc tgc cct acc gtg cag ctt gag gac atc cgc																288
Gln	Ala	Gly	Ala	Arg	Leu	Cys	Pro	Thr	Val	Gln	Leu	Glu	Asp	Ile	Arg	
				85					90					95		
aac ctg cag gat ctc acg cct ctg aag ctg gcc gcc aag gag ggc aag																336
Asn	Leu	Gln	Asp	Leu	Thr	Pro	Leu	Lys	Leu	Ala	Ala	Lys	Glu	Gly	Lys	
			100					105					110			

atc gag att ttc agg cac atc ctg cag cgg gag ttt tca gga ctg agc	384
Ile Glu Ile Phe Arg His Ile Leu Gln Arg Glu Phe Ser Gly Leu Ser	
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cac ctt tcc cga aag ttc acc gag tgg tgc tat ggg cct gtc cgg gtg	432
His Leu Ser Arg Lys Phe Thr Glu Trp Cys Tyr Gly Pro Val Arg Val	
130 135 140	
tcg ctg tat gac ctg gct tct gtg gac agc tgt gag gag aac tca gtg	480
Ser Leu Tyr Asp Leu Ala Ser Val Asp Ser Cys Glu Glu Asn Ser Val	
145 150 155 160	
ctg gag atc att gcc ttt cat tgc aag agc ccg cac cga cac cga atg	528
Leu Glu Ile Ile Ala Phe His Cys Lys Ser Pro His Arg His Arg Met	
165 170 175	
gtc gtt ttg gag ccc ctg aac aaa ctg ctg cag gcg aaa tgg gat ctg	576
Val Val Leu Glu Pro Leu Asn Lys Leu Leu Gln Ala Lys Trp Asp Leu	
180 185 190	
ctc atc ccc aag ttc ttc tta aac ttc ctg tgt aat ctg atc tac atg	624
Leu Ile Pro Lys Phe Phe Leu Asn Phe Leu Cys Asn Leu Ile Tyr Met	
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ttc atc ttc acc gct gtt gcc tac cat cag cct acc ctg aag aag cag	672
Phe Ile Phe Thr Ala Val Ala Tyr His Gln Pro Thr Leu Lys Lys Gln	
210 215 220	
gcc gcc cct cac ctg aaa gcg gag gtt gga aac tcc atg ctg ctg acg	720
Ala Ala Pro His Leu Lys Ala Glu Val Gly Asn Ser Met Leu Leu Thr	
225 230 235 240	
ggc cac atc ctt atc ctg cta ggg ggg atc tac ctc ctc gtg ggc cag	768
Gly His Ile Leu Ile Leu Leu Gly Gly Ile Tyr Leu Leu Val Gly Gln	
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Leu Trp Tyr Phe Trp Arg Arg His Val Phe Ile Trp Ile Ser Phe Ile	
260 265 270	
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Asp Ser Tyr Phe Glu Ile Leu Phe Leu Phe Gln Ala Leu Leu Thr Val	
275 280 285	
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Val Ser Gln Val Leu Cys Phe Leu Ala Ile Glu Trp Tyr Leu Pro Leu	
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Leu Val Ser Ala Leu Val Leu Gly Trp Leu Asn Leu Leu Tyr Tyr Thr	
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Arg Gly Phe Gln His Thr Gly Ile Tyr Ser Val Met Ile Gln Lys Lys	
325 330 335	
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Ala Ile Ser Val Leu Glu Met Glu Asn Gly Tyr Trp Trp Cys Arg Lys	
340 345 350	
aag cag cgg gca ggt gtg atg ctg acc gtt ggc act aag cca gat ggc	1104
Lys Gln Arg Ala Gly Val Met Leu Thr Val Gly Thr Lys Pro Asp Gly	

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Ser Pro Asp Glu Arg Trp Cys Phe Arg Val Glu Glu Val Asn Trp Ala			
370	375	380	
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Ser Trp Glu Gln Thr Leu Pro Thr Leu Cys Glu Asp Pro Ser Gly Ala			
385	390	395	400
ggg gtc cct cga act ctc gag aac cct gtc ctg gct tcc cct ccc aag			1248
Gly Val Pro Arg Thr Leu Glu Asn Pro Val Leu Ala Ser Pro Pro Lys			
	405	410	415
gag gat gag gat ggt gcc tct gag gaa aac tat gtg ccc gtc cag ctc			1296
Glu Asp Glu Asp Gly Ala Ser Glu Glu Asn Tyr Val Pro Val Gln Leu			
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ctc cag tcc aac			1308
Leu Gln Ser Asn			
435			
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Ser Thr His Ala Ser Ala Leu Ser Leu Ala Ala Cys Thr Lys Gln Trp			
1	5	10	15
gat gtg gtg acc tac ctc ctg gag aac cca cac cag ccg gcc agc ctg			97
Asp Val Val Thr Tyr Leu Leu Glu Asn Pro His Gln Pro Ala Ser Leu			
	20	25	30
gag gcc acc gac tcc ctg ggc aac aca gtc ctg cat gct ctg gta atg			145
Glu Ala Thr Asp Ser Leu Gly Asn Thr Val Leu His Ala Leu Val Met			
	35	40	45
att gca gat aac tcg cct gag aac agt gcc ctg gtg atc cac atg tac			193
Ile Ala Asp Asn Ser Pro Glu Asn Ser Ala Leu Val Ile His Met Tyr			
	50	55	60
gac ggg ctt cta caa atg ggg gcg cgc ctc tgc ccc act gtg cag ctt			241
Asp Gly Leu Leu Gln Met Gly Ala Arg Leu Cys Pro Thr Val Gln Leu			
65	70	75	80
gag gaa atc tcc aac cac caa ggc ctc aca ccc ctg aaa cta gcc gcc			289
Glu Glu Ile Ser Asn His Gln Gly Leu Thr Pro Leu Lys Leu Ala Ala			
	85	90	95
aag gaa ggc aaa atc gag att ttc agg cac att ctg cag cgg gaa ttc			337
Lys Glu Gly Lys Ile Glu Ile Phe Arg His Ile Leu Gln Arg Glu Phe			
	100	105	110
tca gga ccg tac cag ccc ctt tcc cga aag ttt act gag tgg tgt tac			385

Ser	Gly	Pro	Tyr	Gln	Pro	Leu	Ser	Arg	Lys	Phe	Thr	Glu	Trp	Cys	Tyr		
		115					120					125					
ggt	cct	gtg	cgg	gta	tcg	ctg	tac	gac	ctg	tcc	tct	gtg	gac	agc	tgg	433	
Gly	Pro	Val	Arg	Val	Ser	Leu	Tyr	Asp	Leu	Ser	Ser	Val	Asp	Ser	Trp		
		130				135					140						
gaa	aag	aac	tcg	gtg	ctg	gag	atc	atc	gct	ttt	cat	tgc	aag	agc	ccg	481	
Glu	Lys	Asn	Ser	Val	Leu	Glu	Ile	Ile	Ala	Phe	His	Cys	Lys	Ser	Pro		
145					150				155						160		
aac	cgg	cac	cgc	atg	gtg	gtt	tta	gaa	cca	ctg	aac	aag	ctt	ctg	cag	529	
Asn	Arg	His	Arg	Met	Val	Val	Leu	Glu	Pro	Leu	Asn	Lys	Leu	Leu	Gln		
				165					170						175		
gag	aaa	tgg	gat	cgg	ctc	gtc	tca	aga	ttc	ttc	ttc	aac	ttc	gcc	tgc	577	
Glu	Lys	Trp	Asp	Arg	Leu	Val	Ser	Arg	Phe	Phe	Phe	Asn	Phe	Ala	Cys		
			180					185						190			
tac	ttg	gtc	tac	atg	ttc	atc	ttc	acc	gtc	gtt	gcc	tac	cac	cag	cct	625	
Tyr	Leu	Val	Tyr	Met	Phe	Ile	Phe	Thr	Val	Val	Ala	Tyr	His	Gln	Pro		
		195					200					205					
tcc	ctg	gat	cag	cca	gcc	atc	ccc	tca	tca	aaa	gcg	act	ttt	ggg	gaa	673	
Ser	Leu	Asp	Gln	Pro	Ala	Ile	Pro	Ser	Ser	Lys	Ala	Thr	Phe	Gly	Glu		
		210				215					220						
tcc	atg	ctg	ctg	ctg	ggc	cac	att	ctg	atc	ctg	ctt	ggg	ggg	att	tac	721	
Ser	Met	Leu	Leu	Leu	Gly	His	Ile	Leu	Ile	Leu	Leu	Gly	Gly	Ile	Tyr		
225					230					235					240		
ctc	tta	ctg	ggc	cag	ctg	tgg	tac	ttt	tgg	cgg	cgg	cgc	ctg	ttt	atc	769	
Leu	Leu	Leu	Gly	Gln	Leu	Trp	Tyr	Phe	Trp	Arg	Arg	Arg	Leu	Phe	Ile		
				245					250					255			
tgg	atc	tca	ttc	atg	gac	agc	tac	ttt	gaa	atc	ctc	ttt	ctc	ctt	cag	817	
Trp	Ile	Ser	Phe	Met	Asp	Ser	Tyr	Phe	Glu	Ile	Leu	Phe	Leu	Leu	Gln		
			260				265						270				
gct	ctg	ctc	aca	gtg	ctg	tcc	cag	gtg	ctg	cgc	ttc	atg	gag	act	gaa	865	
Ala	Leu	Leu	Thr	Val	Leu	Ser	Gln	Val	Leu	Arg	Phe	Met	Glu	Thr	Glu		
		275					280					285					
tgg	tac	cta	ccc	ctg	cta	gtg	tta	tcc	cta	gtg	ctg	ggc	tgg	ctg	aac	913	
Trp	Tyr	Leu	Pro	Leu	Leu	Val	Leu	Ser	Leu	Val	Leu	Gly	Trp	Leu	Asn		
		290				295					300						
ctg	ctt	tac	tac	aca	cgg	ggc	ttt	cag	cac	aca	ggc	atc	tac	agt	gtc	961	
Leu	Leu	Tyr	Tyr	Thr	Arg	Gly	Phe	Gln	His	Thr	Gly	Ile	Tyr	Ser	Val		
305				310						315					320		
atg	atc	cag	aag	gtc	atc	ctt	cga	gac	ctg	ctc	cgt	ttc	ctg	ctg	gtc	1009	
Met	Ile	Gln	Lys	Val	Ile	Leu	Arg	Asp	Leu	Leu	Arg	Phe	Leu	Leu	Val		
				325					330					335			
tac	ctg	gtc	ttc	ctt	ttc	ggc	ttt	gct	gta	gcc	cta	gta	agc	ttg	agc	1057	
Tyr	Leu	Val	Phe	Leu	Phe	Gly	Phe	Ala	Val	Ala	Leu	Val	Ser	Leu	Ser		
			340					345					350				
aga	gag	gcc	cga	agt	ccc	aaa	gcc	cct	gaa	gat	aac	aac	tcc	aca	gtg	1105	
Arg	Glu	Ala	Arg	Ser	Pro	Lys	Ala	Pro	Glu	Asp	Asn	Asn	Ser	Thr	Val		
		355					360					365					

acg gaa cag ccc acg gtg ggc cag gag gag gag cca gct cca tat cgg 1153
 Thr Glu Gln Pro Thr Val Gly Gln Glu Glu Glu Pro Ala Pro Tyr Arg
 370 375 380

agc att ctg gat gcc tcc cta gag ctg ttc aag ttc acc att ggt atg 1201
 Ser Ile Leu Asp Ala Ser Leu Glu Leu Phe Lys Phe Thr Ile Gly Met
 385 390 395 400

ggg gag ctg gct ttc cag gaa cag ctg cgt ttt cgt ggg gtg gtc ctg 1249
 Gly Glu Leu Ala Phe Gln Glu Gln Leu Arg Phe Arg Gly Val Val Leu
 405 410 415

ctg ttg ctg ttg gcc tac gtc ctt ctc acc tac gtc ctg ctg ctc aac 1297
 Leu Leu Leu Leu Ala Tyr Val Leu Thr Tyr Val Leu Leu Leu Asn
 420 425 430

atg ctc att gct ctc atg agc gaa act gtc aac cac gtt gct gac aac 1345
 Met Leu Ile Ala Leu Met Ser Glu Thr Val Asn His Val Ala Asp Asn
 435 440 445

agc tgg agc atc tgg aag ttg cag aaa gcc atc tct gtc ttg gag atg 1393
 Ser Trp Ser Ile Trp Lys Leu Gln Lys Ala Ile Ser Val Leu Glu Met
 450 455 460

gag aat ggt tac tgg tgg tgc cgg agg aag aaa cat cgt gaa ggg agg 1441
 Glu Asn Gly Tyr Trp Trp Cys Arg Arg Lys Lys His Arg Glu Gly Arg
 465 470 475 480

ctg ctg aaa gtc ggc acc agg ggg gat ggt acc cct gat gag cgc tgg 1489
 Leu Leu Lys Val Gly Thr Arg Gly Asp Gly Thr Pro Asp Glu Arg Trp
 485 490 495

tgc ttc agg gtg gag gaa gta aat tgg gct gct tgg gag aag act ctt 1537
 Cys Phe Arg Val Glu Glu Val Asn Trp Ala Ala Trp Glu Lys Thr Leu
 500 505 510

ccc acc tta tct gag gat cca tca ggg cca ggc atc act ggt aat aaa 1585
 Pro Thr Leu Ser Glu Asp Pro Ser Gly Pro Gly Ile Thr Gly Asn Lys
 515 520 525

aag aac cca acc tct aaa ccg ggg aag aac agt gcc tca gag gaa gac 1633
 Lys Asn Pro Thr Ser Lys Pro Gly Lys Asn Ser Ala Ser Glu Glu Asp
 530 535 540

cat ctg ccc ctt cag gtc ctc cag tcc ccc tgatggccca gatgcagcag 1683
 His Leu Pro Leu Gln Val Leu Gln Ser Pro
 545 550

caggctggca ggatggagta gggaatcttc ccagccacac cagaggctac tgaattttgg 1743
 tggaaatata aatatttttt ttgcataaaaa aaaaaaaaaa agggcggccg c 1794

<210> 11
 <211> 554
 <212> PRT
 <213> Rattus sp.

<400> 11
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 Asp Val Val Thr Tyr Leu Leu Glu Asn Pro His Gln Pro Ala Ser Leu
 20 25 30

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		35					40					45			
Ile	Ala	Asp	Asn	Ser	Pro	Glu	Asn	Ser	Ala	Leu	Val	Ile	His	Met	Tyr
	50					55					60				
Asp	Gly	Leu	Leu	Gln	Met	Gly	Ala	Arg	Leu	Cys	Pro	Thr	Val	Gln	Leu
65				70					75						80
Glu	Glu	Ile	Ser	Asn	His	Gln	Gly	Leu	Thr	Pro	Leu	Lys	Leu	Ala	Ala
			85					90						95	
Lys	Glu	Gly	Lys	Ile	Glu	Ile	Phe	Arg	His	Ile	Leu	Gln	Arg	Glu	Phe
			100					105					110		
Ser	Gly	Pro	Tyr	Gln	Pro	Leu	Ser	Arg	Lys	Phe	Thr	Glu	Trp	Cys	Tyr
		115						120				125			
Gly	Pro	Val	Arg	Val	Ser	Leu	Tyr	Asp	Leu	Ser	Ser	Val	Asp	Ser	Trp
	130					135						140			
Glu	Lys	Asn	Ser	Val	Leu	Glu	Ile	Ile	Ala	Phe	His	Cys	Lys	Ser	Pro
145					150					155					160
Asn	Arg	His	Arg	Met	Val	Val	Leu	Glu	Pro	Leu	Asn	Lys	Leu	Leu	Gln
				165					170						175
Glu	Lys	Trp	Asp	Arg	Leu	Val	Ser	Arg	Phe	Phe	Phe	Asn	Phe	Ala	Cys
			180					185					190		
Tyr	Leu	Val	Tyr	Met	Phe	Ile	Phe	Thr	Val	Val	Ala	Tyr	His	Gln	Pro
		195					200						205		
Ser	Leu	Asp	Gln	Pro	Ala	Ile	Pro	Ser	Ser	Lys	Ala	Thr	Phe	Gly	Glu
	210					215					220				
Ser	Met	Leu	Leu	Leu	Gly	His	Ile	Leu	Ile	Leu	Leu	Gly	Gly	Ile	Tyr
225					230					235					240
Leu	Leu	Leu	Gly	Gln	Leu	Trp	Tyr	Phe	Trp	Arg	Arg	Arg	Leu	Phe	Ile
				245					250					255	
Trp	Ile	Ser	Phe	Met	Asp	Ser	Tyr	Phe	Glu	Ile	Leu	Phe	Leu	Leu	Gln
			260					265					270		
Ala	Leu	Leu	Thr	Val	Leu	Ser	Gln	Val	Leu	Arg	Phe	Met	Glu	Thr	Glu
		275					280					285			
Trp	Tyr	Leu	Pro	Leu	Leu	Val	Leu	Ser	Leu	Val	Leu	Gly	Trp	Leu	Asn
	290					295					300				
Leu	Leu	Tyr	Tyr	Thr	Arg	Gly	Phe	Gln	His	Thr	Gly	Ile	Tyr	Ser	Val
305					310					315					320
Met	Ile	Gln	Lys	Val	Ile	Leu	Arg	Asp	Leu	Leu	Arg	Phe	Leu	Leu	Val
				325					330					335	
Tyr	Leu	Val	Phe	Leu	Phe	Gly	Phe	Ala	Val	Ala	Leu	Val	Ser	Leu	Ser
			340					345					350		
Arg	Glu	Ala	Arg	Ser	Pro	Lys	Ala	Pro	Glu	Asp	Asn	Asn	Ser	Thr	Val
		355					360					365			
Thr	Glu	Gln	Pro	Thr	Val	Gly	Gln	Glu	Glu	Glu	Pro	Ala	Pro	Tyr	Arg
	370					375					380				
Ser	Ile	Leu	Asp	Ala	Ser	Leu	Glu	Leu	Phe	Lys	Phe	Thr	Ile	Gly	Met
385					390					395					400
Gly	Glu	Leu	Ala	Phe	Gln	Glu	Gln	Leu	Arg	Phe	Arg	Gly	Val	Val	Leu
				405					410					415	
Leu	Leu	Leu	Leu	Ala	Tyr	Val	Leu	Leu	Thr	Tyr	Val	Leu	Leu	Leu	Asn
			420					425					430		
Met	Leu	Ile	Ala	Leu	Met	Ser	Glu	Thr	Val	Asn	His	Val	Ala	Asp	Asn
	435						440					445			
Ser	Trp	Ser	Ile	Trp	Lys	Leu	Gln	Lys	Ala	Ile	Ser	Val	Leu	Glu	Met
	450					455					460				
Glu	Asn	Gly	Tyr	Trp	Trp	Cys	Arg	Arg	Lys	Lys	His	Arg	Glu	Gly	Arg
465					470					475					480
Leu	Leu	Lys	Val	Gly	Thr	Arg	Gly	Asp	Gly	Thr	Pro	Asp	Glu	Arg	Trp
				485					490					495	
Cys	Phe	Arg	Val	Glu	Glu	Val	Asn	Trp	Ala	Ala	Trp	Glu	Lys	Thr	Leu
			500					505					510		
Pro	Thr	Leu	Ser	Glu	Asp	Pro	Ser	Gly	Pro	Gly	Ile	Thr	Gly	Asn	Lys
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Lys Asn Pro Thr Ser Lys Pro Gly Lys Asn Ser Ala Ser Glu Glu Asp
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His Leu Pro Leu Gln Val Leu Gln Ser Pro
545 550

<210> 12
<211> 1662
<212> DNA
<213> Rattus sp.

<220>
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gat gtg gtg acc tac ctc ctg gag aac cca cac cag ccg gcc agc ctg 96
Asp Val Val Thr Tyr Leu Leu Glu Asn Pro His Gln Pro Ala Ser Leu
20 25 30
gag gcc acc gac tcc ctg ggc aac aca gtc ctg cat gct ctg gta atg 144
Glu Ala Thr Asp Ser Leu Gly Asn Thr Val Leu His Ala Leu Val Met
35 40 45
att gca gat aac tcg cct gag aac agt gcc ctg gtg atc cac atg tac 192
Ile Ala Asp Asn Ser Pro Glu Asn Ser Ala Leu Val Ile His Met Tyr
50 55 60
gac ggg ctt cta caa atg ggg gcg cgc ctc tgc ccc act gtg cag ctt 240
Asp Gly Leu Leu Gln Met Gly Ala Arg Leu Cys Pro Thr Val Gln Leu
65 70 75 80
gag gaa atc tcc aac cac caa ggc ctc aca ccc ctg aaa cta gcc gcc 288
Glu Glu Ile Ser Asn His Gln Gly Leu Thr Pro Leu Lys Leu Ala Ala
85 90 95
aag gaa ggc aaa atc gag att ttc agg cac att ctg cag cgg gaa ttc 336
Lys Glu Gly Lys Ile Glu Ile Phe Arg His Ile Leu Gln Arg Glu Phe
100 105 110
tca gga ccg tac cag ccc ctt tcc cga aag ttt act gag tgg tgt tac 384
Ser Gly Pro Tyr Gln Pro Leu Ser Arg Lys Phe Thr Glu Trp Cys Tyr
115 120 125
ggg cct gtg cgg gta tcg ctg tac gac ctg tcc tct gtg gac agc tgg 432
Gly Pro Val Arg Val Ser Leu Tyr Asp Leu Ser Ser Val Asp Ser Trp
130 135 140
gaa aag aac tcg gtg ctg gag atc atc gct ttt cat tgc aag agc ccg 480
Glu Lys Asn Ser Val Leu Glu Ile Ile Ala Phe His Cys Lys Ser Pro
145 150 155 160
aac cgg cac cgc atg gtg gtt tta gaa cca ctg aac aag ctt ctg cag 528
Asn Arg His Arg Met Val Val Leu Glu Pro Leu Asn Lys Leu Leu Gln
165 170 175
gag aaa tgg gat cgg ctc gtc tca aga ttc ttc ttc aac ttc gcc tgc 576
Glu Lys Trp Asp Arg Leu Val Ser Arg Phe Phe Phe Asn Phe Ala Cys

180	185	190	
tac ttg gtc tac atg ttc atc ttc acc gtc gtt gcc tac cac cag cct Tyr Leu Val Tyr Met Phe Ile Phe Thr Val Val Ala Tyr His Gln Pro 195 200 205			624
tcc ctg gat cag cca gcc atc ccc tca tca aaa gcg act ttt ggg gaa Ser Leu Asp Gln Pro Ala Ile Pro Ser Ser Lys Ala Thr Phe Gly Glu 210 215 220			672
tcc atg ctg ctg ctg ggc cac att ctg atc ctg ctt ggg ggt att tac Ser Met Leu Leu Leu Gly His Ile Leu Ile Leu Leu Gly Gly Ile Tyr 225 230 235 240			720
ctc tta ctg ggc cag ctg tgg tac ttt tgg cgg cgg cgc ctg ttt atc Leu Leu Leu Gly Gln Leu Trp Tyr Phe Trp Arg Arg Arg Leu Phe Ile 245 250 255			768
tgg atc tca ttc atg gac agc tac ttt gaa atc ctc ttt ctc ctt cag Trp Ile Ser Phe Met Asp Ser Tyr Phe Glu Ile Leu Phe Leu Leu Gln 260 265 270			816
gct ctg ctc aca gtg ctg tcc cag gtg ctg cgc ttc atg gag act gaa Ala Leu Leu Thr Val Leu Ser Gln Val Leu Arg Phe Met Glu Thr Glu 275 280 285			864
tgg tac cta ccc ctg cta gtg tta tcc cta gtg ctg ggc tgg ctg aac Trp Tyr Leu Pro Leu Leu Val Leu Ser Leu Val Leu Gly Trp Leu Asn 290 295 300			912
ctg ctt tac tac aca cgg ggc ttt cag cac aca ggc atc tac agt gtc Leu Leu Tyr Tyr Thr Arg Gly Phe Gln His Thr Gly Ile Tyr Ser Val 305 310 315 320			960
atg atc cag aag gtc atc ctt cga gac ctg ctc cgt ttc ctg ctg gtc Met Ile Gln Lys Val Ile Leu Arg Asp Leu Leu Arg Phe Leu Leu Val 325 330 335			1008
tac ctg gtc ttc ctt ttc ggc ttt gct gta gcc cta gta agc ttg agc Tyr Leu Val Phe Leu Phe Gly Phe Ala Val Ala Leu Val Ser Leu Ser 340 345 350			1056
aga gag gcc cga agt ccc aaa gcc cct gaa gat aac aac tcc aca gtg Arg Glu Ala Arg Ser Pro Lys Ala Pro Glu Asp Asn Asn Ser Thr Val 355 360 365			1104
acg gaa cag ccc acg gtg ggc cag gag gag gag cca gct cca tat cgg Thr Glu Gln Pro Thr Val Gly Gln Glu Glu Glu Pro Ala Pro Tyr Arg 370 375 380			1152
agc att ctg gat gcc tcc cta gag ctg ttc aag ttc acc att ggt atg Ser Ile Leu Asp Ala Ser Leu Glu Leu Phe Lys Phe Thr Ile Gly Met 385 390 395 400			1200
ggg gag ctg gct ttc cag gaa cag ctg cgt ttt cgt ggg gtg gtc ctg Gly Glu Leu Ala Phe Gln Glu Gln Leu Arg Phe Arg Gly Val Val Leu 405 410 415			1248
ctg ttg ctg ttg gcc tac gtc ctt ctc acc tac gtc ctg ctg ctc aac Leu Leu Leu Leu Ala Tyr Val Leu Leu Thr Tyr Val Leu Leu Leu Asn 420 425 430			1296

atg ctc att gct ctc atg agc gaa act gtc aac cac gtt gct gac aac	1344
Met Leu Ile Ala Leu Met Ser Glu Thr Val Asn His Val Ala Asp Asn	
435 440 445	
agc tgg agc atc tgg aag ttg cag aaa gcc atc tct gtc ttg gag atg	1392
Ser Trp Ser Ile Trp Lys Leu Gln Lys Ala Ile Ser Val Leu Glu Met	
450 455 460	
gag aat ggt tac tgg tgg tgc cgg agg aag aaa cat cgt gaa ggg agg	1440
Glu Asn Gly Tyr Trp Trp Cys Arg Arg Lys Lys His Arg Glu Gly Arg	
465 470 475 480	
ctg ctg aaa gtc ggc acc agg ggg gat ggt acc cct gat gag cgc tgg	1488
Leu Leu Lys Val Gly Thr Arg Gly Asp Gly Thr Pro Asp Glu Arg Trp	
485 490 495	
tgc ttc agg gtg gag gaa gta aat tgg gct gct tgg gag aag act ctt	1536
Cys Phe Arg Val Glu Glu Val Asn Trp Ala Ala Trp Glu Lys Thr Leu	
500 505 510	
ccc acc tta tct gag gat cca tca ggg cca ggc atc act ggt aat aaa	1584
Pro Thr Leu Ser Glu Asp Pro Ser Gly Pro Gly Ile Thr Gly Asn Lys	
515 520 525	
aag aac cca acc tct aaa ccg ggg aag aac agt gcc tca gag gaa gac	1632
Lys Asn Pro Thr Ser Lys Pro Gly Lys Asn Ser Ala Ser Glu Glu Asp	
530 535 540	
cat ctg ccc ctt cag gtc ctc cag tcc ccc	1662
His Leu Pro Leu Gln Val Leu Gln Ser Pro	
545 550	

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 <213> Artificial Sequence

<220>
 <223> Synthetic peptide

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 1 5 10 15

<210> 14
 <211> 25
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic peptide

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 Arg Pro Glu Ala Pro Thr Gly Pro Asn Ala Thr Glu Ser Val Gln Pro
 1 5 10 15
 Met Glu Gly Gln Glu Asp Glu Gly Asn
 20 25

<210> 15

<211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic peptide

<400> 15
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 1 5 10 15
 Arg Ala Gly

<210> 16
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 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 16
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<210> 17
 <211> 22
 <212> DNA
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<220>
 <223> Primer

<400> 17
 gattcacttg gggacagtga cg 22

<210> 18
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 18
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<210> 19
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 19
 gctgcgggag gaagtgaagc 20

<210> 20
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 <212> PRT
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<400> 20

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Gly	Gly	Gln	Glu	Asp	Gly	Ser	Glu	Ala	Asp	Arg	Gly	Lys	Leu	Asp	Phe
		20						25					30		
Gly	Ser	Gly	Leu	Pro	Pro	Met	Glu	Ser	Gln	Phe	Gln	Gly	Glu	Asp	Arg
		35					40					45			
Lys	Phe	Ala	Pro	Gln	Ile	Arg	Val	Asn	Leu	Asn	Tyr	Arg	Lys	Gly	Thr
	50					55					60				
Gly	Ala	Ser	Gln	Pro	Asp	Pro	Asn	Arg	Phe	Asp	Arg	Asp	Arg	Leu	Phe
65					70					75					80
Asn	Ala	Val	Ser	Arg	Gly	Val	Pro	Glu	Asp	Leu	Ala	Gly	Leu	Pro	Glu
				85					90					95	
Tyr	Leu	Ser	Lys	Thr	Ser	Lys	Tyr	Leu	Thr	Asp	Ser	Glu	Tyr	Thr	Glu
			100					105					110		
Gly	Ser	Thr	Gly	Lys	Thr	Cys	Leu	Met	Lys	Ala	Val	Leu	Asn	Leu	Lys
		115					120					125			
Asp	Gly	Val	Asn	Ala	Cys	Ile	Leu	Pro	Leu	Leu	Gln	Ile	Asp	Arg	Asp
		130				135					140				
Ser	Gly	Asn	Pro	Gln	Pro	Leu	Val	Asn	Ala	Gln	Cys	Thr	Asp	Asp	Tyr
145					150					155					160
Tyr	Arg	Gly	His	Ser	Ala	Leu	His	Ile	Ala	Ile	Glu	Lys	Arg	Ser	Leu
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Gln	Cys	Val	Lys	Leu	Leu	Val	Glu	Asn	Gly	Ala	Asn	Val	His	Ala	Arg
			180					185					190		
Ala	Cys	Gly	Arg	Phe	Phe	Gln	Lys	Gly	Gln	Gly	Thr	Cys	Phe	Tyr	Phe
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Gly	Glu	Leu	Pro	Leu	Ser	Leu	Ala	Ala	Cys	Thr	Lys	Gln	Trp	Asp	Val
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Thr	Asp	Ser	Gln	Gly	Asn	Thr	Val	Leu	His	Ala	Leu	Val	Met	Ile	Ser
			245						250					255	
Asp	Asn	Ser	Ala	Glu	Asn	Ile	Ala	Leu	Val	Thr	Ser	Met	Tyr	Asp	Gly
			260					265					270		
Leu	Leu	Gln	Ala	Gly	Ala	Arg	Leu	Cys	Pro	Thr	Val	Gln	Leu	Glu	Asp
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Ile	Arg	Asn	Leu	Gln	Asp	Leu	Thr	Pro	Leu	Lys	Leu	Ala	Ala	Lys	Glu
		290				295					300				
Gly	Lys	Ile	Glu	Ile	Phe	Arg	His	Ile	Leu	Gln	Arg	Glu	Phe	Ser	Gly
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Arg	Val	Ser	Leu	Tyr	Asp	Leu	Ala	Ser	Val	Asp	Ser	Cys	Glu	Glu	Asn
			340					345					350		
Ser	Val	Leu	Glu	Ile	Ile	Ala	Phe	His	Cys	Lys	Ser	Pro	His	Arg	His
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Arg	Met	Val	Val	Leu	Glu	Pro	Leu	Asn	Lys	Leu	Leu	Gln	Ala	Lys	Trp
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Tyr	Met	Phe	Ile	Phe	Thr	Ala	Val	Ala	Tyr	His	Gln	Pro	Thr	Leu	Lys
			405						410					415	
Lys	Gln	Ala	Ala	Pro	His	Leu	Lys	Ala	Glu	Val	Gly	Asn	Ser	Met	Leu
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Leu	Thr	Gly	His	Ile	Leu	Ile	Leu	Leu	Gly	Gly	Ile	Tyr	Leu	Leu	Val
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Gly	Gln	Leu	Trp	Tyr	Phe	Trp	Arg	Arg	His	Val	Phe	Ile	Trp	Ile	Ser
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Phe	Ile	Asp	Ser	Tyr	Phe	Glu	Ile	Leu	Phe	Leu	Phe	Gln	Ala	Leu	Leu
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 Pro Leu Leu Val Ser Ala Leu Val Leu Gly Trp Leu Asn Leu Leu Tyr
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 Tyr Thr Arg Gly Phe Gln His Thr Gly Ile Tyr Ser Val Met Ile Gln
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 Lys Lys Ala Ile Ser Val Leu Glu Met Glu Asn Gly Tyr Trp Trp Cys
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 Arg Lys Lys Gln Arg Ala Gly Val Met Leu Thr Val Gly Thr Lys Pro
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 Gly Ala Gly Val Pro Arg Thr Leu Glu Asn Pro Val Leu Ala Ser Pro
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 Met Glu Gln Arg Ala Ser Leu Asp Ser Glu Glu
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 tct gag tcc cca ccc caa gag aac tcc tgc ctg gac cct cca gac aga 161
 Ser Glu Ser Pro Pro Gln Glu Asn Ser Cys Leu Asp Pro Pro Asp Arg
 15 20 25

 gac cct aac tgc aag cca cct cca gtc aag ccc cac atc ttc act acc 209
 Asp Pro Asn Cys Lys Pro Pro Pro Val Lys Pro His Ile Phe Thr Thr
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 agg agt cgt acc cgg ctt ttt ggg aag ggt gac tcg gag gag gcc tct 257
 Arg Ser Arg Thr Arg Leu Phe Gly Lys Gly Asp Ser Glu Glu Ala Ser
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 ccc ctg gac tgc cct tat gag gaa ggc ggg ctg gct tcc tgc cct atc 305
 Pro Leu Asp Cys Pro Tyr Glu Glu Gly Gly Leu Ala Ser Cys Pro Ile
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 atc act gtc agc tct gtt cta act atc cag agg cct ggg gat gga cct 353
 Ile Thr Val Ser Ser Val Leu Thr Ile Gln Arg Pro Gly Asp Gly Pro
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 gcc agt gtc agg ccg tca tcc cag gac tcc gtc tcc gct ggt gag aag 401
 Ala Ser Val Arg Pro Ser Ser Gln Asp Ser Val Ser Ala Gly Glu Lys
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 ccc ccg agg ctc tat gat cgc agg agc atc ttc gat gct gtg gct cag 449

Pro	Pro	Arg	Leu	Tyr	Asp	Arg	Arg	Ser	Ile	Phe	Asp	Ala	Val	Ala	Gln		
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agt	aac	tgc	cag	gag	ctg	gag	agc	ctg	ctg	ccc	ttc	ctg	cag	agg	agc	497	
Ser	Asn	Cys	Gln	Glu	Leu	Glu	Ser	Leu	Leu	Pro	Phe	Leu	Gln	Arg	Ser		
	125					130					135						
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Lys	Lys	Arg	Leu	Thr	Asp	Ser	Glu	Phe	Lys	Asp	Pro	Glu	Thr	Gly	Lys		
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acc	tgt	ctg	cta	aaa	gcc	atg	ctc	aat	ctg	cac	aat	ggg	cag	aat	gac	593	
Thr	Cys	Leu	Leu	Lys	Ala	Met	Leu	Asn	Leu	His	Asn	Gly	Gln	Asn	Asp		
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acc	atc	gct	ctg	ctc	ctg	gac	gtt	gcc	cgg	aag	aca	gac	agc	ctg	aag	641	
Thr	Ile	Ala	Leu	Leu	Leu	Asp	Val	Ala	Arg	Lys	Thr	Asp	Ser	Leu	Lys		
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cag	ttt	gtc	aat	gcc	agc	tac	aca	gac	agc	tac	tac	aag	ggc	cag	aca	689	
Gln	Phe	Val	Asn	Ala	Ser	Tyr	Thr	Asp	Ser	Tyr	Tyr	Lys	Gly	Gln	Thr		
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gca	ctg	cac	att	gcc	att	gaa	cgg	cgg	aac	atg	acg	ctg	gtg	acc	ctc	737	
Ala	Leu	His	Ile	Ala	Ile	Glu	Arg	Arg	Asn	Met	Thr	Leu	Val	Thr	Leu		
	205					210					215						
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Leu	Val	Glu	Asn	Gly	Ala	Asp	Val	Gln	Ala	Ala	Ala	Asn	Gly	Asp	Phe		
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Phe	Lys	Lys	Thr	Lys	Gly	Arg	Pro	Gly	Phe	Tyr	Phe	Gly	Glu	Leu	Pro		
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ctg	tcc	ctg	gct	gcg	tgc	acc	aac	cag	ctg	gcc	att	gtg	aag	ttc	ctg	881	
Leu	Ser	Leu	Ala	Ala	Cys	Thr	Asn	Gln	Leu	Ala	Ile	Val	Lys	Phe	Leu		
			255					260					265				
ctg	cag	aac	tcc	tgg	cag	cct	gca	gac	atc	agc	gcc	cgg	gac	tca	gtg	929	
Leu	Gln	Asn	Ser	Trp	Gln	Pro	Ala	Asp	Ile	Ser	Ala	Arg	Asp	Ser	Val		
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ggc	aac	acg	gtg	ctt	cat	gcc	ctg	gtg	gag	gtg	gca	gat	aac	aca	gtt	977	
Gly	Asn	Thr	Val	Leu	His	Ala	Leu	Val	Glu	Val	Ala	Asp	Asn	Thr	Val		
	285					290					295						
gac	aac	acc	aag	ttc	gtg	aca	agc	atg	tac	aac	gag	atc	ttg	atc	ctg	1025	
Asp	Asn	Thr	Lys	Phe	Val	Thr	Ser	Met	Tyr	Asn	Glu	Ile	Leu	Ile	Leu		
300					305					310					315		
ggg	gcc	aaa	ctc	cac	ccc	acg	ctg	aag	ctg	gaa	gag	atc	acc	aac	agg	1073	
Gly	Ala	Lys	Leu	His	Pro	Thr	Leu	Lys	Leu	Glu	Glu	Ile	Thr	Asn	Arg		
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aag	ggg	ctc	acg	cca	ctg	gct	ctg	gct	gct	agc	agt	ggg	aag	atc	ggg	1121	
Lys	Gly	Leu	Thr	Pro	Leu	Ala	Leu	Ala	Ala	Ser	Ser	Gly	Lys	Ile	Gly		
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gtc	ttg	gcc	tac	att	ctc	cag	agg	gag	atc	cat	gaa	ccc	gag	tgc	cga	1169	
Val	Leu	Ala	Tyr	Ile	Leu	Gln	Arg	Glu	Ile	His	Glu	Pro	Glu	Cys	Arg		
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His Leu Ser Arg Lys Phe Thr Glu Trp Ala Tyr Gly Pro Val His Ser	
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tcc ctt tat gac ctg tcc tgc att gac acc tgt gaa aag aac tcg gtt	1265
Ser Leu Tyr Asp Leu Ser Cys Ile Asp Thr Cys Glu Lys Asn Ser Val	
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ctg gag gtg atc gct tac agc agc agt gag acc cct aac cgt cat gac	1313
Leu Glu Val Ile Ala Tyr Ser Ser Ser Glu Thr Pro Asn Arg His Asp	
400 405 410	
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Met Leu Leu Val Glu Pro Leu Asn Arg Leu Leu Gln Asp Lys Trp Asp	
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Arg Phe Val Lys Arg Ile Phe Tyr Phe Asn Phe Phe Val Tyr Cys Leu	
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tat atg atc atc ttc acc gcg gct gcc tac tat cgg cct gtg gaa ggc	1457
Tyr Met Ile Ile Phe Thr Ala Ala Ala Tyr Tyr Arg Pro Val Glu Gly	
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Leu Pro Pro Tyr Lys Leu Lys Asn Thr Val Gly Asp Tyr Phe Arg Val	
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Thr Gly Glu Ile Leu Ser Val Ser Gly Gly Val Tyr Phe Phe Phe Arg	
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ggg att caa tat ttc ctg cag agg cga cca tcc ctc aag agt ttg ttt	1601
Gly Ile Gln Tyr Phe Leu Gln Arg Arg Pro Ser Leu Lys Ser Leu Phe	
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Val Asp Ser Tyr Ser Glu Ile Leu Phe Phe Val Gln Ser Leu Phe Met	
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Leu Val Ser Val Val Leu Tyr Phe Ser Gln Arg Lys Glu Tyr Val Ala	
525 530 535	
tcc atg gtg ttc tcc ctg gcc atg ggc tgg acc aac atg ctc tac tat	1745
Ser Met Val Phe Ser Leu Ala Met Gly Trp Thr Asn Met Leu Tyr Tyr	
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Thr Arg Gly Phe Gln Gln Met Gly Ile Tyr Ala Val Met Ile Glu Lys	
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Met Ile Leu Arg Asp Leu Cys Arg Phe Met Phe Val Tyr Leu Val Phe	
575 580 585	
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Leu Phe Gly Phe Ser Thr Ala Val Val Thr Leu Ile Glu Asp Gly Lys	
590 595 600	
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Asn	Asn	Ser	Leu	Pro	Met	Glu	Ser	Thr	Pro	His	Lys	Cys	Arg	Gly	Ser		
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gcc	tgc	aag	cca	ggt	aac	tct	tac	aac	agc	ctg	tat	tcc	aca	tgt	ctg	1985	
Ala	Cys	Lys	Pro	Gly	Asn	Ser	Tyr	Asn	Ser	Leu	Tyr	Ser	Thr	Cys	Leu		
620					625					630					635		
gag	ctg	ttc	aag	ttc	acc	atc	ggc	atg	ggc	gac	ctg	gag	ttc	act	gag	2033	
Glu	Leu	Phe	Lys	Phe	Thr	Ile	Gly	Met	Gly	Asp	Leu	Glu	Phe	Thr	Glu		
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aac	tac	gac	ttc	aag	gct	gtc	ttc	atc	atc	ctg	tta	ctg	gcc	tat	gtg	2081	
Asn	Tyr	Asp	Phe	Lys	Ala	Val	Phe	Ile	Ile	Leu	Leu	Leu	Ala	Tyr	Val		
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Ile	Leu	Thr	Tyr	Ile	Leu	Leu	Leu	Asn	Met	Leu	Ile	Ala	Leu	Met	Gly		
			670				675					680					
gag	acc	gtc	aac	aag	att	gca	caa	gag	agc	aag	aac	atc	tgg	aag	ctg	2177	
Glu	Thr	Val	Asn	Lys	Ile	Ala	Gln	Glu	Ser	Lys	Asn	Ile	Trp	Lys	Leu		
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cag	aga	gcc	atc	acc	atc	ctg	gat	aca	gag	aag	agc	ttc	ctg	aag	tgc	2225	
Gln	Arg	Ala	Ile	Thr	Ile	Leu	Asp	Thr	Glu	Lys	Ser	Phe	Leu	Lys	Cys		
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Met	Arg	Lys	Ala	Phe	Arg	Ser	Gly	Lys	Leu	Leu	Gln	Val	Gly	Phe	Thr		
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cct	gac	ggc	aag	gat	gac	tac	cgg	tgg	tgt	ttc	agg	gtg	gac	gag	gta	2321	
Pro	Asp	Gly	Lys	Asp	Asp	Tyr	Arg	Trp	Cys	Phe	Arg	Val	Asp	Glu	Val		
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aac	tgg	act	acc	tgg	aac	acc	aat	gtg	ggt	atc	atc	aac	gag	gac	cca	2369	
Asn	Trp	Thr	Thr	Trp	Asn	Thr	Asn	Val	Gly	Ile	Ile	Asn	Glu	Asp	Pro		
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ggc	cga	gtt	tca	ggg	aga	aac	tgg	aag	aac	ttt	gcc	ctg	gtt	ccc	ctt	2465	
Gly	Arg	Val	Ser	Gly	Arg	Asn	Trp	Lys	Asn	Phe	Ala	Leu	Val	Pro	Leu		
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ctg	agg	gat	gca	agc	act	cga	gat	aga	cat	gcc	acc	cag	cag	gaa	gaa	2513	
Leu	Arg	Asp	Ala	Ser	Thr	Arg	Asp	Arg	His	Ala	Thr	Gln	Gln	Glu	Glu		
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Val	Gln	Leu	Lys	His	Tyr	Thr	Gly	Ser	Leu	Lys	Pro	Glu	Asp	Ala	Glu		
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gtt	ttc	aag	gat	tcc	atg	gtc	cca	ggg	gag	aaa	taa	tgga	cactat			2607	
Val	Phe	Lys	Asp	Ser	Met	Val	Pro	Gly	Glu	Lys	*						
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 Leu Phe Gly Lys Gly Asp Ser Glu Glu Ala Ser Pro Leu Asp Cys Pro
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 Tyr Glu Glu Gly Gly Leu Ala Ser Cys Pro Ile Ile Thr Val Ser Ser
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 Val Leu Thr Ile Gln Arg Pro Gly Asp Gly Pro Ala Ser Val Arg Pro
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 Asp Arg Arg Ser Ile Phe Asp Ala Val Ala Gln Ser Asn Cys Gln Glu
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 Asp Ser Glu Phe Lys Asp Pro Glu Thr Gly Lys Thr Cys Leu Leu Lys
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 180 185 190
 Ser Tyr Thr Asp Ser Tyr Tyr Lys Gly Gln Thr Ala Leu His Ile Ala
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 Ile Glu Arg Arg Asn Met Thr Leu Val Thr Leu Leu Val Glu Asn Gly
 210 215 220
 Ala Asp Val Gln Ala Ala Asn Gly Asp Phe Phe Lys Lys Thr Lys
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 Gly Arg Pro Gly Phe Tyr Phe Gly Glu Leu Pro Leu Ser Leu Ala Ala
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 Cys Thr Asn Gln Leu Ala Ile Val Lys Phe Leu Leu Gln Asn Ser Trp
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 Gln Pro Ala Asp Ile Ser Ala Arg Asp Ser Val Gly Asn Thr Val Leu
 275 280 285
 His Ala Leu Val Glu Val Ala Asp Asn Thr Val Asp Asn Thr Lys Phe
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 Val Thr Ser Met Tyr Asn Glu Ile Leu Ile Leu Gly Ala Lys Leu His
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 Pro Thr Leu Lys Leu Glu Glu Ile Thr Asn Arg Lys Gly Leu Thr Pro
 325 330 335
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 Leu Gln Arg Glu Ile His Glu Pro Glu Cys Arg His Leu Ser Arg Lys
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 Phe Thr Glu Trp Ala Tyr Gly Pro Val His Ser Ser Leu Tyr Asp Leu
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 Ser Cys Ile Asp Thr Cys Glu Lys Asn Ser Val Leu Glu Val Ile Ala
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			20					25						30	

Lys